UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
777 Sonoma Ave., Room 219-A
Santa Rosa, CA 95404-6528

Instructions for Applicants
Version III

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- Read through the biological opinion at http://swr.nmfs.noaa.gov/rcbo.htm to determine whether or not the project fits under the BO
- See attached documents pertaining to project description, additional avoidance measures and terms and conditions
  - Description of proposed action – (Attachment I)
  - Terms and conditions – (Attachment II)
  - Appendix 1 (additional avoidance measures) – (Attachment III)
  - Appendix 2 (pre-project monitoring) – (Attachment IV)
  - Post Project Monitoring Checklist – (Attachment V - Due within 120 days of implementation)
- Fill out the attached application checklist – (Attachment VI) and include project description and spill prevention plan

Please return all originals to Natalie Badrei at the NOAA RC (contact info above) and keep copies for your records

II. DESCRIPTION OF THE PROPOSED ACTION

The Corps proposes to authorize the placement of fill material into the waters of the United States to annually implement multiple salmonid habitat restoration projects that are part of the Program. Up to 500 salmonid restoration projects over a ten year period will be authorized in streams and adjacent riparian areas within the jurisdiction of NMFS' Santa Rosa office (Figure 1). The purpose of this action is to provide a streamlined regulatory permitting opportunity through the Corps for landowners, governmental agencies, and non-governmental agencies interested in conserving, restoring, and enhancing salmonid habitats. The Program creates a process for the Corps to streamline permitting requirements for landowners and agencies to implement specific conservation practices on private and public lands within the regulatory jurisdiction of NMFS' Santa Rosa Office. Activities included under this Program may be permitted under, but not limited to, the Corps' Nationwide 27 for Wetland and Riparian Restoration and Creation Activities or Nationwide 13 for Bank Stabilization projects. The Corps will provide this streamlined permitting process to landowners and agencies who agree to carry out their projects in conformance to the practices specified in the description below and associated appendices.

This biological opinion (BO) will address routine restoration practices determined by the Corps, in prior collaboration[1] with NMFS, Suscon, NOAA RC, the Santa Cruz Resource Conservation District, *Alnus* Ecological, and CDFG, as having potential to adversely affect listed salmonids and/or adversely modify their designated critical habitats. Restoration activities typically occur in watersheds subjected to significant levels of logging, road building, urbanization, mining, grazing, and other activities that have reduced the quality and quantity of instream habitat available for native anadromous salmonids. Types of authorized projects include: instream habitat improvement, fish passage improvement (including construction of new fish ladders/fishways and maintenance of existing ladders), bank stabilization, riparian restoration, upslope restoration, and fish screens. Project types are described in greater detail in Sections A and C below.

The majority of the actions considered in this BO closely follow those described in: (1) the CDFG Manual (Flosi *et al.* 1998), (2) NMFS' *Guidelines for Salmonid Passage at Stream Crossings* (NMFS 2000 hereafter referred to as NMFS' Crossing Guidelines), and (3) NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a hereafter referred to as NMFS' Screening Guidelines). These documents guide many of the restoration projects implemented within the jurisdictional boundaries of NMFS' Santa Rosa office, including those covered under the expired RGP1 and, projects funded by NOAA's RC. Other actions include fish ladder maintenance and permanent removal of summer dams.

[1] These agencies worked together to define restoration project types that were likely to result in short-term adverse effects to listed species. The result of this collaboration is the Program being analyzed in this biological opinion.

Prohibited activities are described in Section B below. Minimization and Avoidance measures and Monitoring Requirements are described in Appendix 1 and 2, respectively. Oversight and administration of this program is described in Section D. As described in greater detail below in Section D, NOAA RC, based out of NMFS' Santa Rosa office, will provide the lead role in the administration and oversight of this Program. They will participate in the screening of individual projects under consideration for inclusion in the Program, and will track implementation of individual projects. Such tracking will include documentation and reporting back to the Protected Resource Division (PRD) of NMFS of any incidental take that results from individual projects authorized under this BO.

A. Enhancement and Restoration Projects

1. Instream Enhancement and Restoration Projects

Habitat enhancement and restoration projects authorized through the proposed Program will be designed and implemented consistent with techniques and minimization measures presented in the CDFG Manual, NMFS Crossing Guidelines, and NMFS Screening Guidelines in order to maximize the benefits of each project while minimizing potential short term, adverse impacts to salmonids. Additional avoidance and minimization practices will likely be necessary for all projects in order to reduce the potential for ancillary impacts to both salmonids and other riparian and aquatic species on a site specific basis. These measures, which are mandatory for projects included in the Program, are described in Appendix 1. All of the restoration projects included in this Program are intended to restore degraded salmonid habitat; improve instream cover, pool habitat, and spawning gravel; remove and/or modify barriers to fish passage; and reduce or eliminate ongoing erosion and sedimentation impacts.

Instream habitat structures and improvements are intended to provide predator escape and resting cover, increase spawning habitat, improve upstream and downstream migration corridors, improve pool to riffle ratios, and add habitat complexity and diversity. Specific techniques for instream habitat improvements may include: placement of cover structures (divide logs, digger logs, spider logs, and log, root wad, and boulder combinations), boulder structures (boulder weirs, vortex boulder weirs, boulder clusters, and single and opposing log wing-deflectors), log structures (log weirs, upsurge weirs, single and opposing log wing-deflectors, and Hewitt ramps), and placement of imported spawning gravel. Implementation of these types of projects may require the use of heavy equipment (*i.e.*, self-propelled logging yarders, helicopters, mechanical excavators, backhoes, *etc.*); however, hand labor is the preferred method and will be used when possible. Large woody debris (LWD) may also be used to enhance pool formation and improve stream reaches. For placement of unanchored LWD, logs selected for placement will have a minimum diameter of 12 inches and a minimum length 1. 5 times the mean bankfull width of the stream channel at the deployment site. Root wads will be selected with care and have a minimum root bole diameter of five feet and a minimum length of 15 feet.

2. Instream Barrier Modification for Fish Passage Improvement

Instream barrier modification projects are intended to improve salmonid fish passage and increase access to currently inaccessible or difficult to access salmonid habitat. Projects may include those which improve fish passage through existing culverts, bridges, and paved and unpaved fords through replacement, removal, or retrofitting of these existing structures. In particular, these practices may include the use of gradient control weirs upstream or downstream of the barriers to control water velocity, water surface elevation, and/or provide sufficient pool habitat to facilitate jumps, or interior baffles or weirs to mediate velocity and the affects of shallow sheet flow. Weirs may also be used to improve passage in flood control channels (particularly in concrete lined channels). Implementing these types of projects may require the use of heavy equipment (*i.e.*, mechanical excavators, backhoes, *etc.*); however, hand labor will be used when possible.

Activities associated with the maintenance of existing fish ladders/fishways are also included in this category of restoration projects. Maintenance activities covered by this program include complete removal of garbage, construction waste and debris, sediment, wood, industrial debris, and anything else that prevents the proper functioning of existing fish ladders/fishways.

Due to the complex and site specific nature of stream crossing remediation projects, neither the CDFG Manual nor the NMFS Crossing Guidelines provide design protocols for constructing individual replacement structures. However, these documents do provide consistent methods for evaluating fish passage through culverts at stream crossings, and will aid in assessing fish passage through other types of stream crossings, such as bridges and paved or hardened fords. The objectives of these documents are to provide the user with: consistent methods for evaluating salmonid passage though stream crossings; ranking criteria for prioritizing stream crossing sites for treatment; treatment options to provide unimpeded fish passage; a stream crossing remediation project checklist; guidance measures to minimize impacts during stream crossing remediation construction; and five methods for monitoring the effectiveness of corrective treatments. Projects authorized under the proposed Program must be designed and implemented consistent with the CDFG *Culvert Criteria for Fish Passage* (Appendix IX-A, CDFG Manual) and NMFS' Crossing Guidelines.

In addition, all fish passage improvement projects will require design review and design approval from a NMFS and/or CDFG fish passage specialist prior to project authorization. Similarly, summer dam removal projects will require design review and design approval from a NMFS and/or CDFG fish passage specialist prior to project authorization and design review from a qualified geomorphologist.

3. Stream Bank Stabilization and Riparian Habitat Restoration

These projects are intended improve salmonid habitat through increased stream shading that will ultimately lower stream temperatures, increased future recruitment of LWD to streams, and increased bank stability and invertebrate production. Riparian habitat

restoration projects will aid in the restoration of riparian habitat by increasing the number of plants and plant groupings, and will include the following types of projects: natural regeneration, livestock exclusionary fencing, bioengineering, and revegetation projects. Part XI of the CDFG Manual, titled *Riparian Habitat Restoration*, contains some examples of these techniques.

Stream bank stabilization will result in the reduction of sediment input and will improve fish habitat and fish survival by increasing fish embryo and alevin survival in spawning gravels, reducing injury to juvenile salmonids from high concentrations of suspended sediment, increasing macroinvertebrate food production, and minimizing the loss of, or reduction in size, of pools from excess sediment deposition. The proposed activities will reduce sediment from bank erosion by stabilizing stream banks with appropriate site specific techniques including: boulder stream bank stabilization structures, log stream bank stabilization structures, tree revetment, native plant material revetment, willow wall revetment, willow siltation baffles, brush mattresses, checkdams, brush checkdams, water bars, and exclusionary fencing. Some guidelines for stream bank stabilization techniques are described in Part VII of the CDFG Manual, entitled *Project Implementation.* Implementation of these types of projects may require the use of heavy equipment (*i.e.*, self-propelled logging yarders, mechanical excavators, backhoes, *etc.*); however, hand labor will be used when possible.

4. Project Types Requiring Additional Oversight and Engineering Review by NMFS

More complex project types covered by the Program will require a higher level of oversight (engineering review, *etc.*) and review by NMFS regulatory agency staff and agency engineers. These project types will include:

- culvert retrofit and replacement projects;
- construction of new fish ladders/fishways;
- retrofitting of older fish ladders/fishways;
- permanent removal of flashboard dam abutments and sills;
- installation of fish screens; and
- placement of weirs in concrete lined channels.

Specific requirements associated with these more complex project types include the following:

- For stream crossing projects, if the stream at the project location was passable to, or was not utilized by all life stages of covered salmonids prior to the existence of the crossing, the project shall pass the life stages and covered salmonid species historically passing there. Retrofit culverts shall meet the

fish passage criteria for the passage needs of the listed species and life stages historically passing through the site prior to the existence of the road crossing according to NMFS Crossing Guidelines and CDFG stream crossing criteria (Appendix X of the CDFG Manual).

- All designs for fish ladders/fishways and culvert replacement or modification projects must be reviewed and authorized by a NMFS (or CDFG) fish passage specialist prior to commencement of work.

- All designs for fish ladders/fishways and culvert replacement or modification designs must be designed and stamped by an Engineer registered in the State of California.

- Fish ladders/fishways larger than 30 feet in height are not covered by this Program.

- New ladders/fishways shall be constructed to provide passage conditions suitable for year round bidirectional, adult and juvenile salmonid movement.

- New ladders will have a maximum vertical jump of six inches.

- Flow patterns in new ladders must be stable, with no water surges.

- Energy dissipation in new ladders should be complete in a step-and-pool fishway, with no carryover from pool to pool.

- Sediment composition and quantity, and effects of sediment transport must be evaluated by a qualified geomorphologist for all summer dam removal projects.

B. Prohibited Activities

Projects that include any of the following elements will not be authorized under this Program and would require separate consultation with NMFS:

- use of gabion baskets;

- use of cylindrical riprap (*e.g.*, Aqualogs);

- use of undersized riprap (rock that will not remain in place during a 100 year flow event);

- permanent dams or construction of concrete lined channels of any sort;

- use of chemically-treated timbers used for grade or channel stabilization structures, bulkheads or other instream structures;

- activities substantially disrupting the movement of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the project areas;

- projects that would completely eliminate a riffle, pool, or riffle/pool complex (*Note: There may be some instances where a riffle/pool complex is affected/modified by a restoration project [i.e., a culvert removal that affects an existing pool]. These types of projects would be allowed under the Program.*); and

- water diversions (except to dewater a restoration project construction site).

C. Limitations on Size and Number of Projects Authorized for Implementation Each Year Under the Proposed Program

In order to minimize the potential for short term adverse impacts associated with implementation of the projects authorized under the Program, the following limitations were placed on individual projects and on the total number of projects authorized each year:

1. Limits on Area of Disturbance for Individual Projects

a. Maximum Length of Stream Dewatered Per Project:

- Three hundred feet (ft). Impact analyses will also assume potential effects of increased turbidity of 100 ft downstream for each project involving dewatering making a total maximum length of impact per project 400 ft.

b. Maximum Upslope Disturbance (raw dirt, tree removal, canopy cover reduction):

- The disturbance footprint for the project's staging areas may not exceed 0.25 acres.

- Overstory canopy cover may not be reduced by more 20 percent (per linear 100 ft) within 75 ft of a watercourse or lake transition line as measured by a spherical densitometer (using a minimum of four measurements from each cardinal direction).

- Native trees with defects, cavities, leaning toward the stream channel, nests, late seral characteristics, or > 36 inches (in) diameter at breast height (dbh), and large snags > 16 in dbh and 20 ft high will be retained. In limited cases, removal will be permitted if trees/snags occur over culvert fill that requires removal for retrofit projects. No removal will occur without a site visit and written approval from NOAA RC.

- Downed trees (logs) > 24 in dbh and 10 ft long will be retained on upslope sites.

2. Buffer Between Projects Implemented in the Same Year

A 1200 ft linear buffer will be placed between projects implemented within the same year within the same watershed under the Program. This is intended to minimize the potential for short term accumulation of adverse impacts within a stream.

3. Limit on Total Number of Projects

Approximately 35-40 projects are expected to be authorized each year under this Program. It is possible once this Program is in place, there will be increased interest among the restoration community to authorize their actions through this Program. Therefore, the Corps proposed a maximum of 50 projects per year to be authorized under the Program to accommodate a potential for increased project activity as a result of this effort.

4. Limit on Number of Projects Per Watershed

Under this Program, there will also be an annual per-watershed limitation of three projects occurring in any one watershed per year (using California Interagency Watershed Map of 1999, CalWater 2.2.1).

5. Limits on Removal of Vegetation

While encouraged, removal of exotic invasives in a stream with high temperatures must be done in a manner to avoid creation of additional temperature loading to fish bearing streams. If a stream has a seven day moving average daily maximum (7DMADM) temperature greater than 17.8 degree Celsius (^{o} C) in a coho salmon and steelhead stream or greater than 18.5^{o}C in a stream with only steelhead, and vegetation management would reduce overstory shade canopy to the wetted channel, then the practice will not be allowed.

D. Oversight and Administration

The following section outlines the process for administration of the Program. NOAA RC will bear primary Program administration responsibilities. The Corps staff will communicate directly with staff from NOAA RC regarding all proposed actions falling within the authority of the Program. Project applications for fisheries restoration projects, consistent with those actions covered by the Program, will require a Corps permit[2]. To assist NOAA RC staff with the tracking and oversight of projects, a

[2] NOAA RC website will also include contact information so that project applications could be submitted directly to NOAA RC staff in Santa Rosa. NOAA RC website will include a link to the Corps' website which provides instructions for the Corps' application requirements. (Note: Since applicable NOAA RC-

"TEAM" has been designated and is comprised of staff from NOAA RC, NMFS PRD, CDFG staff (when available), and *Alnus* Ecological. This TEAM will assist NOAA RC in tracking the overall number and locations of projects that are authorized under the Program each year to ensure the limits outlined above are adhered to. The following summarizes the anticipated process for reviewing individual projects for consideration and authorization under the Program and the annual administration process.

1. Timeline for Submittals/Review

Project applications will likely be submitted to the Corps throughout the year and distributed to Corps staff for review. As described in Step 3 below, the Corps staff may request concurrence from NOAA RC on an ongoing basis for projects to be included under this Program. NOAA RC will "bundle" those projects to be covered under the Program for review and processing approximately twice a year (possibly more frequently depending on demand), likely in the early winter (December/January) and spring (May/June) of each year. NOAA RC with assistance from the TEAM will review projects for consistency with the project conditions (protection, avoidance, and minimization measures) of the Program.

2. Submittal Requirements

Project applicants seeking coverage under the Program's regulatory approvals must submit sufficient information about their project to allow the Corps and NOAA RC to determine whether or not the project qualifies for coverage under the Program. Project proposals without sufficient information will not be processed and will not be covered under the Program until all relevant information necessary to initiate section 7 consultation is provided. Necessary information includes, but is not limited to: (1) a description of the project location, (2) proposed timing of construction activities, (3) a description of construction methods, (4) relevant engineering and design criteria and reports, (5) presence of listed salmonids, (6) proposed methods of fish capture and relocation, and (7) proposed erosion control measures.

3. Corps Staff Requests Concurrence from NOAA RC

If the Corps determines during their initial screening of a project that it comports to the conditions of the BO, the Corps will contact either Leah Mahan ((707) 575-6077) or Kit Crump ((707) 575-6080) or another designated NOAA RC staff and request preliminary concurrence with their determination of the project's coverage under the BO. The Corps will not authorize the project until Steps 4 – 5 are complete.

4. Batched Submittal to NOAA RC and Field Checks if Deemed Necessary

Once NOAA RC receives a preliminary concurrence request from Corps staff, NOAA RC will complete a "paper check" to confirm whether or not a project fits under the Program using a pre-established checklist (Checklist for Consistency – Appendix B of the

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funded projects will also require a Corps permit, NOAA RC would coordinate closely with the Corps to ensure that they have received the project application for the appropriate Corps permit as well.)

BA). Once projects have passed through the initial project screen, NOAA RC will compile a single report that will include information about each project (size, description, practice type, ESUs and/or DPSs present, *etc.*) proposed for authorization for the upcoming construction season.

NOAA RC staff and CDFG staff will provide additional screening by taking into consideration any potential resource vulnerability associated with a particular activity or project location (*i.e.*, projects in sensitive streams or watersheds). NOAA RC staff (and CDFG staff when available) would review the project list and identify projects requiring a field check prior to determining whether or not they may be authorized under the Program. In this case, NOAA RC would coordinate with a predetermined network of regional experts in the field (which will include, but is not necessarily limited to) NOAA RC, NMFS PRD, CDFG staff if available, and *Alnus* Ecological (who will be funded by either Sustainable Conservation or the Coastal Conservancy) to conduct a field check to confirm whether or not a project may proceed under the Program. In addition, if the project requires engineering review by a CDFG or NMFS engineer (described above under Section C. 2) or geomorphologist, NOAA RC will coordinate with these engineers/fish passage specialist and/or geomorphologist to get their input on the project design at this stage.

5. Written Authorization by NOAA RC and NMFS PRD

Following any necessary site visits to confirm whether or not the project may proceed under the Program, and to ensure that the specific requirements of the Program are part of the individual project plans, the California NOAA RC Supervisor will provide a summary of these projects, at least once a year, to the NMFS PRD Santa Rosa Area Office Supervisor who will sign-off that the proposed project(s) comport to the conditions authorized under this BO. Next, NOAA RC will provide written documentation to the Corps that the project is included in the Program. For projects to be considered part of the Program, project applicants must accept any additional minimization and avoidance measures NOAA RC determines to be necessary to protect listed salmonids or their habitat. A copy of the written documentation will be forwarded to the NMFS PRD Santa Rosa Area Office Supervisor.

6. Corps Authorization and Project Construction

With the Corps' approval (and all other necessary approvals and permits in hand), authorized projects will be implemented by the applicants, incorporating applicable guidelines and required protection measures.

7. Post Construction Implementation Monitoring and Reporting on 100% of Projects

Qualifying applicants will be required to carry out all post-construction implementation monitoring (Appendix B of the BA) for projects authorized under the Program. This will include photo-documentation (using standardized guidelines for photo-documentation consistent with the pre-construction monitoring requirements), as-builts, evidence of implementation of required avoidance, minimization, and mitigation measures,

information about number (and species) of fish relocated and any fish mortality that resulted from the project. This information will be submitted by the applicants to the Corps and NOAA RC for data assembly described in Step 8.

8. Project Tracking and the Annual Report

NOAA RC, with assistance from the TEAM, will maintain a database of information about all of the projects implemented under the Program. In order to monitor the impacts to the protected ESUs, DPSs, and critical habitats over the life of the Program, and to track incidental take of listed salmonids, NOAA RC (with assistance from the TEAM) will annually prepare a report of the previous year's restoration activities (Appendix B of the BA) and submit the report to the NMFS PRD Santa Rosa Area Office Supervisor. The annual report will contain information about projects implemented during the previous construction season, including the number of projects that required fish relocation.

E. Monitoring and Reporting Requirements

The Program will utilize the monitoring protocols developed by CDFG in their partnership with the Center for Forestry, University of California, Berkeley (R. Harris, Principal Investigator). These are the same monitoring protocols CDFG follows in implementing their Fisheries Restoration Grant Program (Appendix B of CDFG Manual). The most current version of these guidelines was released in March 2005 and can be found at: http://nature.berkeley.edu/forestry/comp_proj/dfg.html. These guidelines will be utilized for the pre- and post- construction monitoring for this Program (Appendix B of the BA) along with additional measures outlined in Appendix 2 of this BO.

For projects that may result in incidental take of coho salmon; (*i.e.,* that will require dewatering and fish relocations activities in a stream historically known to support coho salmon – see Appendix C of the BA), the applicant will also need to comply with the requirements of the California Endangered Species Act (CESA). CESA requires that impacts be minimized and fully mitigated and that funding for implementation is assured. Therefore, for projects with grant funding for implementation, the funding assurance shall be the grant/agreement itself, showing monies earmarked for implementation of necessary protection measures during implementation and follow-up monitoring, or another mechanism approved by CDFG in writing. For projects that have no grant funding, the applicant shall be required to provide security in the form of a cash deposit in an amount approved in writing by CDFG and held by CDFG or another pre-approved entity. The funding security will be held until the required measures have been successfully implemented.

F. Action Area

This BO applies to restoration activities that take place within portions of the following counties that encompass the 16,126 square miles of NMFS' Santa Rosa office's regulatory jurisdictional boundaries: Marin, Mendocino, Monterey, Napa, San Benito, San Francisco, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, Solano, and

Sonoma (Figure 1). Restoration projects will occur within stream channels, riparian areas and hydrologically-linked upslope areas within these counties. These counties include, either in whole or in part, the following 4th field hydrologic unit code (HUC), as defined by United States Geological Survey (USGS): South Fork Eel, Middle Fork Eel, Upper Eel, Mattole, Big-Navarro-Garcia, Gualala-Salmon, Russian, Bodega Bay (tributaries), Tomales-Drakes Bay (tributaries), San Francisco Bay (tributaries), Suisun Bay (tributaries), San Pablo Bay (tributaries), Coyote, San Francisco Coastal South, San Lorenzo-Soquel, Pajaro, Estrella, Salinas, Alisal-Elkhorn Sloughs, Carmel, and Central Coastal.

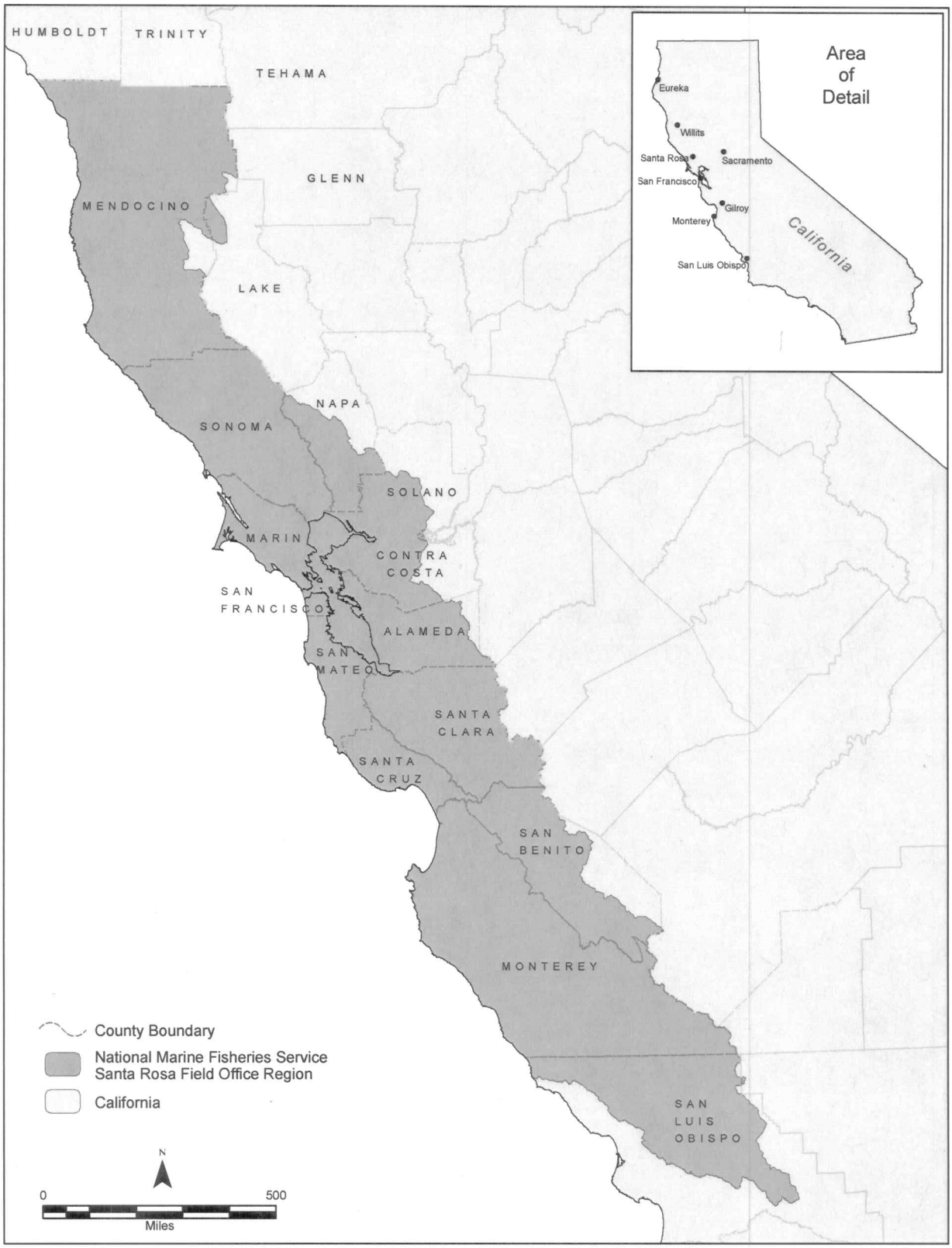

Figure 1. Geographic scope of Program to facilitate implementation of fisheries restoration projects in the region of NMFS' Santa Rosa office.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Corps and the permittee (NOAA RC) must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. The following terms and conditions implement Reasonable and Prudent Measure 1, which states that measures shall be taken to minimize harm and mortality to listed salmonids resulting from construction:

   a. The fisheries biologist shall monitor work activities and instream habitat a minimum of three times per week during construction for the purpose of identifying and reconciling any condition that could adversely affect salmonids or their habitat.

   b. The fisheries biologist shall have the authority to cease construction activities in order to resolve any unanticipated adverse impact resulting from construction.

2. The following term and condition implements Reasonable and Prudent Measure 2, which states that a monitoring report shall be provided to NMFS:

   A written report shall be provided to NMFS (Jonathan Ambrose) within 120 calendar days following the completion of the construction phase of the proposed action. The report shall include, in addition to measures outlined in Appendix B of the BA, the number and approximate size (mm) of listed salmonids captured and removed; any effect of the proposed action on listed salmonids; and photographs taken before, during, and after the activity from photo reference points.

3. The following term and condition implements Reasonable and Prudent Measure 3, which states a spill prevention plan will be in place prior to construction:

   The spill prevention plan will be reviewed and approved by NOAA RC prior to construction. The plan will be sent to:

   Mr. Patrick Rutten
   NOAA Restoration Center
   777 Sonoma Avenue, Rm. 219-A
   Santa Rosa, California 95404

4. The following terms and conditions implement Reasonable and Prudent Measure 4, which states project proponents shall review and implement the minimization and avoidance measures, as proposed by the Corps, prior to construction:

a. Appendix 1 of this BO and the terms and conditions of the BO shall be provided in the final Corps authorization for restoration projects authorized under this consultation.

b. Construction crews and the qualified fisheries biologist(s) shall have a copy of Appendix 1 and the terms and conditions of this BO on site during construction.

5. The following term and condition implements Reasonable and Prudent Measure 5, which states construction of new fish ladders shall be considered as a last resort when evaluating improvements to salmonids passage:

   Project proponents of new fish ladders shall include an analysis, including financial feasibility, of barrier modification (*i.e.*, culvert removal, bridge reconstruction, concrete apron removal, *etc.*) in place of ladder construction. Project proponents shall also evaluate the feasibility (including financial feasibility) of construction of a natural fishway in place of ladder construction. This analysis shall be provided for review and consideration by the TEAM prior to NMFS/CDFG engineering/fish passage review.

6. The following term and condition implements Reasonable and Prudent Measure 6, which states fish passage enhancement measures shall only facilitate passage into historical habitat:

   Fish passage enhancement actions, that facilitate anadromous salmonid migration into stream reaches without any prior historical access, are not permitted.

7. The following term and condition implements Reasonable and Prudent Measure 7, which states sediment minimization measures shall apply to LWD placement actions:

   Root wads placed instream to enhance salmonid habitat shall be largely free of fine sediment prior to placement.

8. The following term and condition implements Reasonable and Prudent Measure 8, which states that additional permit conditions may be added by the NOAA RC:

   The NOAA RC may place additional site specific conditions on any restoration project in order to protect listed salmonids or their critical habitat from otherwise unforeseen adverse circumstances. The Corps shall incorporate these additional site specific conditions into their permits.

Appendix 1

Protection and Minimization Measures as Described in the Biological Assessment

The following protection and minimization measures, as they apply to a particular project, shall be incorporated into the project descriptions for individual projects authorized under this programmatic fisheries restoration project (Program).

A. General Protection Measures

1. Work shall not begin until the U.S. Army Corps of Engineers (Corps) has notified the permittee that the requirements of the Endangered Species Act (ESA) have been satisfied and that the activity is authorized.

2. The general construction season will be from June 15 to October 15. Restoration, construction, fish relocation, and dewatering activities within any wetted and/or flowing creek channel shall only occur within this window. As such, all non-revegetation-associated earthmoving activities will be complete by October 15. Revegetation outside of the active channel may continue beyond October 15 until November 15, if necessary. Limited earthmoving associated with preparation of the site for revegetation may occur within the October 15 - November 15 timeframe, but only as necessary for revegetation efforts. Work beyond this time frame may be authorized following consultation with and approval of the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG) on an individual project basis, provided it could be completed prior to the first significant rainfall event (rainfall event > two inches).

3. Prior to construction, each contractor will be provided with the specific protective measures to be followed during implementation of the project. In addition, a qualified biologist will provide the construction crew with information on the listed species in the project area, the protection afforded the species by the ESA, and guidance on those specific protection measures that must be implemented as part of the project.

4. All adverse aquatic impacts, including temporary impacts, must proceed through a sequencing of impact reduction: avoidance, reduction in size of impact, and compensation (mitigation). Mitigation may be proposed to compensate for the adverse impacts to water of the United States. Mitigation shall generally be in kind, with no net loss of waters of the United States on a per project basis. Mitigation work shall proceed in advance or concurrently with project construction.

5. Construction within 200 feet of established riparian vegetation or other bird nesting habitats shall be avoided during the migratory bird nesting season (February 15 - August 1), to avoid damage or disturbance to nests. If construction must occur during this period, a qualified biologist or individual approved by CDFG will conduct a pre-construction survey for bird nests or nesting activity in the project area. If any active nests or nesting behaviors are found (for native species), an exclusion zone of 75 feet

shall be established to protect nesting birds (200 ft for raptors) and maintained until birds have fledged or nest is abandoned. If any listed or sensitive bird species are identified, CDFG will be notified prior to further action. Take of active bird nests is prohibited under this Program.

6. Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter a live stream. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications.

7. Herbicides may be applied to control established stands of non-native species including, but not limited to, vinca, ivy, and broom. Herbicides must be applied to those species according to the registered label conditions. Herbicides must be applied directly to plants and may not be spread upon any water. Herbicides will be tinted with a biodegradable dye to facilitate visual control of the spray.

8. Rock used for bank stabilization or to anchor large woody debris (LWD) structures, shall be large and heavy enough to remain stationary under the 100-year median January or February flow event (which ever is greater).

9. If the thalweg of the stream has been altered due to construction activities, efforts will be undertaken to reestablish it to its original configuration. (*Note: Projects that may include activities such the use of willow baffles which may alter the thalweg are allowed under the Program.*)

B. Requirements for Fish Relocation and Dewatering Activities

1. Guidelines for Dewatering:

Project activities authorized under the Program may require fish relocation and/or dewatering activities. Dewatering may not be appropriate for some projects that will result in only minor input of sediment, such as placing logs with hand crews or helicopters, or installing boulder clusters. Adherence to these general guidelines will minimize potential impacts for projects that do require dewatering of a stream/creek:

a. In those specific cases where it is deemed necessary to work in a flowing stream/creek, the work area shall be isolated and all the flowing water shall be temporarily diverted around the work site to maintain downstream flows during construction. Dewatering will likely not be necessary for most LWD enhancement activities.

b. Exclude fish from reentering the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. The bottom of the seine must be completely secured to the channel bed to prevent fish from

reentering the work area prior to dewatering. Exclusion screening must be placed in areas of low water velocity to minimize fish impingement. Screens must be checked periodically and cleaned of debris to permit free flow of water. Block net mesh shall be sized to ensure salmonids upstream or downstream do not enter the areas proposed for dewatering between passes with the electrofisher or seine.

c. Prior to dewatering, determine the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates (as described more fully below under *General Conditions for Fish Capture and Relocation*). The project applicant shall bypass stream flow around the work area and concurrently maintain the stream flow to channel below the construction site.

d. Coordinate project site dewatering with a qualified biologist to perform fish and amphibian relocation activities. The qualified biologist(s) will possess a valid State of California Scientific Collection Permit as issued by CDFG and will be familiar with the life history and identification of listed salmonids and listed amphibians within the action area.

e. Prior to dewatering a construction site, qualified individuals will capture and relocate fish and amphibians to avoid direct mortality and minimize take. This is especially important if listed species are present within the project site.

f. Minimize the length of the dewatered stream channel and duration of dewatering. A maximum of 300 feet (ft) may be dewatered under the Program. Exceeding the 300 ft limit will disqualify the project from inclusion in the Program.

g. Any temporary dam or other artificial obstruction constructed shall only be built from materials such as sandbags or clean gravel which will cause little or no siltation or turbidity. Visqueen shall be placed over sandbags used for construction of cofferdams to minimize water seepage into the construction areas. The visqueen shall be firmly anchored to the streambed to minimize water seepage. Cofferdams and the stream diversion systems shall remain in place and fully functional throughout the construction period.

h. Downstream flows adequate to prevent stranding will be maintained at all times during dewatering activities.

i. When cofferdams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet. Bypass pipes will be monitored a minimum of two times per day, seven days a week, during the construction period. All accumulated debris shall be removed by the contractor or project applicant.

j. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer baseflow.

k. The work area may need to be periodically pumped dry of seepage. Place pumps in flat areas, well away from the stream channel. Secure pumps by tying off to a tree or stake in place to prevent movement by vibration. Refuel in an area well away from the stream channel and place fuel absorbent mats under pump while refueling. Pump intakes shall adhere to NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a). Check intake periodically for impingement of fish or amphibians.

l. When pumping is necessary to dewater a work site temporary siltation basin are required to ensure sediment does not re-enter the wetted channel. Screens on pumps will adhere to NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a).

m. When construction is completed, the flow diversion structure shall be removed as soon as possible in a manner that will allow flow to resume with the least disturbance to the substrate. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. This will minimize the risk of beaching and stranding of fish as the area upstream becomes dewatered.

C. General Conditions for all Fish Capture and Relocation Activities

Fish relocation and dewatering activities shall only occur between June 15 and October 15 of each year.

1. Overview

All seining, electrofishing, and relocation activities shall be performed by a qualified fisheries biologist. The qualified fisheries biologist shall capture and relocate listed salmonids prior to construction of the water diversion structures (*e.g.,* cofferdams). The qualified fisheries biologist shall document the number of salmonids observed in the affected area, the number and species of salmonids relocated, and the date and time of collection and relocation. The qualified fisheries biologist shall have a minimum of three years field experience in the identification and capture of salmonids, including juvenile salmonids, considered in the biological opinion. The qualified biologist will adhere to the following requirements for capture and transport of salmonids:

a. Determine the most efficient means for capturing fish. Complex stream habitat generally requires the use of electrofishing equipment, whereas in deep pools, fish may be concentrated by pumping-down the pool and then seining or dipnetting fish.

b. Notify NMFS two weeks prior to capture and relocation of salmonids to provide NMFS an opportunity to attend (call Jonathan Ambrose at 707-575-6091 or via email at jonathan.ambrose@noaa.gov).

c. Initial fish relocation efforts will be conducted several days prior to the start of construction. This provides the fisheries biologist an opportunity to return to the work area and perform additional electrofishing passes immediately prior to construction. In many instances, additional fish will be captured that eluded the previous day's efforts.

d. During dewatering, a fisheries biologist will remain at the project work site to net and rescue any additional fish that may have become stranded throughout the dewatering process.

e. In regions of California with high summer water temperatures, perform relocation activities during morning periods.

f. Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s):

   i. similar water temperature as capture location;

   ii. ample habitat availability prior to release of captured fish; and

   iii. low likelihood of fish reentering work site or becoming impinged on exclusion net or screen.

g. Periodically measure air and water temperatures. Cease activities when measured water temperatures exceed 17.8 degree Celsius (°C) (or 18.4°C in areas where coho salmon are not present). Temperatures will be continuously measured at the head-of-riffle tail-of- pool interface during relocation activities.

2. Electrofishing Guidelines

The following methods shall be used if fish are relocated via electrofishing:

a. All electrofishing will be conducted according to NMFS' *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act*, June 2000.

b. The backpack electrofisher shall be set as follows when capturing fish:

Voltage setting on the electrofisher shall not exceed 300 volts.

	Initial	Maximum
Voltage:	100 Volts	300 Volts
Duration:	500 µs (microseconds)	5 ms (milliseconds)
Frequency:	30 Hertz	70 Hertz;

c. A minimum of three passes with the electrofisher shall be utilized to ensure maximum capture probability of salmonids within the area proposed for dewatering.

d. No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter (μS/cm) or when instream water temperatures exceed 17.8° C (or 18.4° C in areas where coho salmon are not present). Water temperatures shall be measured at the pool/riffle interface. Only direct current (DC) shall be used.

e. A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and other aquatic vertebrates.

3. Seining Guidelines

The following methods shall be used if fish are removed with seines:

a. A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of salmonids within the area.

b. All captured fish shall be processed and released prior to each subsequent pass with the seine.

c. The seine mesh shall be adequately sized to ensure fish are not gilled during capture and relocation activities.

4. Guidelines for Relocation of Salmonids

The following methods shall be used during relocation activities associated with either method of capture (electrofishing or seining):

a. Fish shall not be overcrowded into buckets; allowing approximately six cubic inches per 0+ individual and more for larger/older fish.

b. Every effort shall be made not to mix (including use of separate containers) 0+ (young of the year) salmonids with larger salmonids, or other potential predators, which may consume the smaller salmonids. Have at least two containers and segregate 0+ fish from larger age-classes. Place larger amphibians, such as Pacific-giant salamanders (*Dicamptodon ensatus*), in container with larger fish.

c. Salmonid predators, such as sculpins (*Cottus sp.*) and Pacific-giant salamanders, collected and relocated during electrofishing or seining activities shall not be relocated so as to concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of sculpins and Pacific-giant salamanders into the steelhead and coho salmon relocation pools. To minimize predation on salmonids, these species shall be distributed throughout the wetted portion of the

stream so as to not concentrate them in one area.

d. All captured salmonids shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured fish shall be placed into a pool, preferably with a depth of greater than two feet and with available instream cover (undercut banks, complex LWD features).

e. All captured salmonids will be processed and released prior to conducting a subsequent electrofishing or seining pass.

f. All native captured fish will be allowed to recover from electrofishing before being returned to the stream.

g. Minimize handling of salmonids. However, when handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear DEET-based insect repellants during relocation activities.

h. Temporarily hold fish in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery-powered external bubbler. Protect fish from jostling and noise and do not remove fish from this container until time of release.

i. Place a non-mercury thermometer in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds those allowed by CDFG and NMFS, fish shall be immediately released.

j. If instream temperatures exceed authorized temperature limits, capture and relocation will cease.

k. In areas where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.

l. Visually identify species and estimate year-classes of fish at time of release. Count and record the number of fish captured. Avoid anesthetizing or measuring fish.

m. If more than three percent of the steelhead and Southern Oregon/Northern California Coast (SONCC) Evolutionary Significant Unit (ESU) coho salmon, or one percent of CCC ESU coho captured are killed or injured, the project permittee shall contact NMFS' biologist Jonathan Ambrose by phone immediately at (707) 575-6091. If Mr. Ambrose cannot be reached, the Santa Rosa NMFS Office will be contacted at Federal Relay 1-866-327-8877 ([707] 578-8555). The purpose of the contact is to review the activities resulting in the lethal take and to determine if additional protective measures are required. All steelhead and coho mortalities must be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, fork length, location of capture, and

frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NMFS.

D. Measures to Minimize and Avoid Disturbance from Instream Construction

Measures to minimize and avoid disturbance associated with instream habitat restoration construction activities are presented below:

1. If the stream channel is seasonally dry between June 15 and October 15, construction will occur during this dry period.

2. Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering the waters of the State. Any of these materials, placed within or where they may enter a stream or lake, by the applicant or any party working under contract, or with permission of the applicant, shall be removed immediately. During project activities, all trash that may attract potential predators of salmonids will be properly contained, removed from the work site, and disposed of daily.

3. Where feasible, the construction shall occur from the bank, or on a temporary pad underlain with filter fabric.

4. No mechanized equipment (with internal combustion engines), including internal combustion handtools, will enter wetted channels.

5. Use of heavy equipment (in dewatered channels) shall be avoided in a channel bottom with rocky or cobbled substrate. If access to the work site requires crossing a rocky or cobbled substrate, a rubber tire loader/backhoe is the preferred vehicle. Only after this option has been determined infeasible will the use of tracked vehicles be considered. The amount of time this equipment is stationed, working, or traveling within the creek bed shall be minimized. When heavy equipment is used, woody debris and vegetation on banks and in the channel shall be minimally disturbed if outside of the project's scope.

6. Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters. Vegetable-based hydraulic fluids are preferred.

7. The use or storage of petroleum-powered equipment shall be accomplished in a manner to prevent the potential release of petroleum materials into waters of the State (Fish and Game Code 5650).

8. Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.

9. Prior to use, clean all equipment to remove external oil, grease, dirt, or mud. Wash

sites must be located in upland locations so wash water does not flow into the stream channel or adjacent wetlands.

10. All construction equipment must be in good working condition, showing no signs of fuel or oil leaks. Prior to construction, all mechanical equipment shall be thoroughly inspected and evaluated for the potential of fluid leakage. All questionable motor oil, coolant, transmission fluid, and hydraulic fluid hoses, fittings, and seals shall be replaced. The contractor shall document in writing all hoses, fittings, and seals replaced and shall keep this documentation until the completion of operations. All mechanical equipment shall be inspected on a daily basis to ensure there is no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks shall be repaired in the equipment staging area or other suitable location prior to resumption of construction activity.

11. Oil absorbent and spill containment materials shall be located on site when mechanical equipment is in operation within 100 feet of the proposed watercourse crossings. If a spill occurs, (1) no additional work shall occur in-channel until the mechanical equipment is inspected by the contractor, and the leak has been repaired, (2) the spill has been contained, and (3) CDFG and NMFS are contacted and have evaluated the impacts of the spill.

E. Measures to Minimize Degradation of Water Quality

Construction or maintenance activities for the projects covered under this Program may result in temporary increases in turbidity levels in the stream. In general, these activities must not result in significant increases in turbidity levels beyond the naturally occurring, background conditions. The following measures would be implemented to reduce the potential for impacts to water quality during and after construction:

1. General Erosion Control during Construction

    a. Isolate the construction area from flowing water until project materials are installed and erosion protection is in place except as provided in Section B. Most large woody debris projects will not require dewatering.

    b. Effective erosion control measures shall be in place at all times during construction. Do not start construction until all temporary erosion control devices (straw bales with sterile, weed-free straw, silt fences, *etc.*) are in place downslope or downstream of project site within the riparian area. The devices shall be properly installed at all locations where the likelihood of sediment input exists. These devices shall be in place during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment-laden water on site. If continued erosion is likely to occur after construction is completed, then appropriate erosion prevention measures shall be implemented and maintained until erosion has subsided.

c. Sediment shall be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be staked and dug into the ground 12 centimeters (cm) and only sterile, weed free straw shall be utilized. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.

d. Sediment-laden water created by construction activity shall be filtered before it leaves the right-of-way or enters the stream network or an aquatic resource area. Silt fences or other detention methods shall be installed as close as possible to culvert outlets to reduce the amount of sediment entering aquatic systems.

e. The contractor/project applicant is required to inspect and repair/maintain all erosion control practices prior to and after any significant storm event, at 24 hour intervals during extended storm events, and a minimum of every two weeks until all erosion control measures have been completed.

2. Post Construction Erosion Control

a. Immediately after project completion and before close of seasonal work window, stabilize all exposed soil with mulch, seeding, and/or placement of erosion control blankets. Remove all artificial erosion control devices after the project area has fully stabilized. All exposed soil present in and around the project site shall be stabilized within seven days.

b. All bare and/or disturbed slopes (> 10 ft x 10 ft of bare mineral soil) will be treated with erosion control measures such as hay bales, netting, fiber rolls, native mulch/slash, and hydroseed as permanent erosion control measures.

c. Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage shall be 95 percent with a minimum depth of two inches.

d. When seeding is used as an erosion control measure, only native seed will be used.

e. Sterile, weed-free straw, free of exotic weeds, is required when hay bales are used as an erosion control measure.

3. Guidelines for Temporary Stockpiling

a. Minimize temporary stockpiling of material. Stockpile excavated material in areas where it cannot enter the stream channel. Prior to start of construction, determine if such sites are available at or near the project location. If nearby sites are unavailable, determine location where material will be deposited. Establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams supporting, or historically supporting populations of listed salmonids. Spoils shall be contoured to disperse runoff and stabilized with

mulch and (native) vegetation. Use devices such as plastic sheeting held down with rocks or sandbags over stockpiles, silt fences, or berms of hay bales, to minimize movement of exposed or stockpiled soils.

b. If feasible, conserve topsoil for reuse at project location or use in other areas. End haul spoils away from watercourses as soon as possible to minimize potential sediment delivery.

F. Minimizing Potential for Adverse Effects Due to Scour

1. When needed, utilize instream grade control structures to control channel scour, sediment routing, and headwall cutting.

2. If a pipe or structure that empties into a stream is installed, an energy dissipater shall be installed to reduce bed and bank scour.

3. The toe of rock slope protection shall be placed below bed scour to ensure stability.

H. Measures to Minimize Loss or Disturbance of Riparian Vegetation

Measures to minimize loss or disturbance to riparian vegetation are described below. The revegetation and success criteria that will be adhered to for projects implemented under this Program that result in disturbance to riparian vegetation are also described below.

1. Minimizing Disturbance

a. Retain as many trees and brush as feasible, emphasizing shade producing and bank stabilizing trees and brush.

b. Use project designs and access points that minimize riparian disturbance without affecting less stable areas, which may increase the risk of channel instability.

c. Prior to construction, determine locations and equipment access points that minimize riparian disturbance. Avoid entering unstable areas.

d. Decompact disturbed soils at project completion as the heavy equipment exits the construction area. At the completion of the project, soil compaction that is not an integral element of the design of a crossing shall be decompacted.

e. If riparian vegetation is to be removed with chainsaws, consider using saws that operate with vegetable-based bar oil.

2. Revegetation and Success Criteria

a. Any stream bank area left barren of vegetation as a result of the implementation or maintenance of the restoration practices shall be restored to a natural state by

seeding, replanting, or other agreed upon means (including natural recruitment) with native trees, shrubs, and/or grasses prior to November 15 of the project year. Barren areas shall typically be planted with a combination of willow stakes, native shrubs and trees and/or erosion control grass mixes.

b. Native plant species shall be used for revegetation of disturbed and compacted areas. The species used shall be specific to the project vicinity or the region of the state where the project is located, and comprised of a diverse community structure (plantings shall include both woody and herbaceous species).

c. For projects where re-vegetation is implemented to compensate for riparian vegetation impacted by project construction, a re-vegetation monitoring report will be required after five years to document success. Success is defined as 80 percent (%) survival of plantings or 80% ground cover for broadcast planting of seed after a period of three years. If revegetation efforts will be passive (*i.e.*, natural regeneration), success will be defined as total cover of woody and herbaceous material equal to or greater than pre-project conditions. If at the end of three years, the vegetation has not successfully been re-established, the applicant will be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. If success is not achieved within the first five years, the project applicant will need to prepare a follow-up report in an additional five years. This requirement will proceed in five year increments until success is achieved.

I. Measures to Minimize Impacts to Non-Surfaced Roads in Project Area

Upon the completion of restoration activities, non-surfaced roads within the riparian zone used for the permitted activity shall be weather proofed according to measures as described in *Handbook for Forest and Ranch Roads* by Weaver and Hagans (1994) of Pacific Watershed Associates and in Part X of the CDFG Restoration Manual entitled "*Upslope Assessment and Restoration Practices*". The following are some of the methods that may be applied to non-surfaced roads impacted by project activities implemented under this Program:

1. Establish waterbreaks (*e.g.*, waterbars and rolling dips) on all seasonal roads, skid trails, paths, and fire breaks by October 15. Do not remove waterbreaks until May 15.

2. Maximum distance for waterbreaks shall not exceed the following standards: (a) for road or trail gradients less than 10%: 100 ft; (b) for road or trail gradients 11-25%: 75 ft; (c) for road or trail gradients 26-50%: 50 ft; (d) for road or trail gradients greater than 50%: 50 ft. Depending on site specific conditions, more frequent intervals may be required to prevent road surface rilling and erosion.

3. Locate waterbreaks to allow water to be discharged onto some form of vegetative cover, slash, rocks, or less erodible material. Do not discharge waterbreaks onto unconsolidated fill.

4. Waterbreaks shall be cut diagonally a minimum of six inches into the firm roadbed, skid trail, or firebreak surface and shall have a continuous firm embankment of at least six inches in height immediately adjacent to the lower edge of the waterbreak cut.

5. The maintenance period for waterbreaks and any other erosion control facilities shall occur after every major storm event for the first year after installation.

6. Rolling-dips are preferred over waterbars. Waterbars shall only be used on unsurfaced roads where winter use (including use by bikes, horses, and hikers) will not occur or in steep areas where rolling dips are not practical.

7. After the first year of installation, erosion control facilities shall be inspected prior to the winter period (October 15) after the first major storm event, and prior to the end of the winter period (May 15).

8. The applicant will establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams supporting, or historically supporting, populations of listed salmonids. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation.

9. No berms are allowed on the outside of the road edge.

10. No herbicides shall be used on vegetation on inside ditches.

J. Requirements for New Fish Ladders and Fishways

1. New fish ladders/fishways shall be checked (and maintained as necessary) at least two times per week to ensure the pools are free of excess sediment or debris that may impair passage for the life of the ladder.

2. If the fish ladder/fishways becomes damaged or ineffective the project applicant shall, as soon as reasonably possible, repair any damage or modify the ladder (in consultation with NMFS and CDFG engineers/fish passage specialists).

3. Fish ladders/fishways will be checked prior to the adult migration season. All debris and sediment will be removed to ensure the ladder is fully functional according to fish passage design criteria.

4. The final design must be reviewed and approved by a NMFS/CDFG engineers/fish passage specialist. The design must address the following:

a. species of salmonids present in the river system, as well as magnitude and timing of adult migration;

b. probable access route to the barrier, including areas where fish will congregate below the obstruction;

c. extent of spawning and nursery areas and potential salmonid production from both above and below the obstruction;

d. type and quantity of anticipated transportable debris;

e. frequency, duration, timing, and magnitude of anticipated flows, especially extreme high and low flows; and

f. location of other barriers in the stream system, and their possible effects to distribution of salmonids.

5. The ladder shall not exceed 30 feet in height.

6. A maintenance plan for the ladder/fishway must be reviewed and approved by NMFS/CDFG engineers/fish passage specialists and NOAA RC.

7. Adequate access to the ladder/fishway to facilitate necessary maintenance activities during winter high flows and summer low flow periods must be included in the design.

8. Flow patterns must be stable, with no water surges.

9. Flows in and near the ladder/fishway entrance should be sufficient to attract fish at all water levels.

10. Minimum height between pools in fish ladders shall not exceed six inches.

11. New ladders shall be constructed to provide passage conditions suitable for year round bidirectional, adult and juvenile salmonid movement.

12. A debris deflector should be incorporated at the flow intake.

13. The upstream exit must allow fish to easily reach secure resting habitat.

14. Fishways/ladders must be deep enough for the largest known fish in the system.

K. Summer Dam Abutment Removal

1. Summer dam removal will require design review and approval from a NMFS and/or CDFG fish passage specialist prior to project authorization and design review by a qualified geomorphologist.

2. Sediment composition and quantity, and effects of sediment transport must be evaluated by a qualified geomorphologist for all summer dam removal projects.

Appendix 2

A. Pre-Project Monitoring and Submittal Requirements

The following information will be collected by the applicants with assistance from qualified consulting biologists. Project applicants would submit the following information either to the U.S. Army Corps of Engineers (Corps) (as part of their application for a Corps Permit) or directly to the NOAA Restoration Center (NOAA RC) (for Restoration Center funded projects).

1. Pre-project photo monitoring data (per California Department of Fish and Game's (CDFG) Manual).

2. The project description shall include the following:

   a. A project problem statement.

   b. The project goals and objectives (including target species), *etc.*

   c. The watershed context.

   d. A description of the type of project and restoration techniques proposed (culvert replacement, instream habitat improvements, *etc*).

   e. The project dimensions, including an analysis of hydrology and sediment transport for ladders and culvert retrofits.

   f. A description of construction activities anticipated (types of equipment, timing, staging areas or access roads required).

   g. If dewatering of the work site will be necessary, a description of temporary dewatering methods including qualified individual(s) who will be onsite to transport and relocate protected salmonids.

   h. The proposed construction start and end dates.

   i. The estimated number of creek crossings and type of vehicle(s) that will cross.

   j. The materials that are proposed to be used as part of the restoration action.

   k. When vegetation will be adversely affected as a result of the project, (including removal and replacement), the project applicant will provide a visual assessment of dominant native shrubs and trees, approximate species diversity, and approximate acreage.

l. A description of existing site conditions and explanation of how proposed activities improve or maintain these conditions for steelhead and/or coho salmon.

m. A description of key habitat elements for coho salmon and steelhead in the project area (*i.e.*, temperature, type of pool, riffle, and flatwater habitats, an estimate of instream shelter and shelter components, maximum water depths, dominant substrate types, *etc.*).

n. A description of applicable minimization and avoidance measures incorporated into the individual project (as described in Appendix 1 of this Biological Opinion (BO)).

o. A description of any proposed deviations from that authorized in the biological assessment (BA) and associated BO from the National Marine Fisheries Service (NMFS) will be clearly described. It is likely that any proposed deviations from the activities described in the *Project Description* of the enclosed BO, will result in the project not being covered under this Program and would require individual consultation with the Corps.

p. A proposed monitoring plan for the project describing how the project applicants will ensure compliance with the applicable monitoring requirements described in this Program description (revegetation, *etc.*), including the source of funding for implementation of the monitoring plan.

q. For projects that may result in incidental take of coho salmon (*i.e.*, that will require dewatering and fish relocation activities in a stream historically known to support coho, see Appendix C of the BA), the applicant will also need to comply with the requirements of the California Endangered Species Act (CESA). CESA requires that impacts be minimized and fully mitigated and that funding for implementation is assured. Therefore, for projects that have grant funding for implementation, the funding assurance shall be the grant/agreement itself, showing monies earmarked for implementation of necessary protection measures during implementation and follow-up monitoring, or another mechanism approved by CDFG in writing. For projects that have no such grant funding, the applicant shall be required to provide security in the form of a cash deposit in an amount approved in writing by CDFG and held by CDFG or another mechanism approved in writing by CDFG. The funding security will be held until the required measures have been successfully implemented.

r. A "Checklist" of project conditions that the applicant will sign, verifying the will adhere to these project conditions during project design and implementation (Enclosure B of the BA).

B. Post Construction Monitoring and Reporting Requirements

Implementation monitoring would be conducted for all projects implemented under the proposed Program. Following construction, individual applicants would submit a post-construction, implementation report to NOAA RC and the Corps. Submittal requirements would include project as-built plans and photo documentation of project implementation taken before, during, and after construction utilizing CDFG photo monitoring protocols. For fish relocation activities, the report would include: all fisheries data collected by a qualified fisheries biologist which shall include the number of listed salmonids killed or injured during the proposed action; the number and size (in millimeters) of listed salmonids captured and removed; and any effects of the proposed action on listed salmonids not previously considered.

1. Specific Requirements for New Fish Ladder/Fishway Projects

The following additional requirements must be documented in the post construction report(s) for fish ladder/fishway projects:

1. At least four photo reference points of the fish ladder/fishway shall be established following construction. Photos shall be taken under a variety of flow conditions including winter high flows (including at least one bankfull event) and summer low flows once a year for a minimum of two years.

2. The report shall contain all information available indicating the project was constructed as designed (or changes are clearly shown). Additionally, a design validation report shall be completed after seasonal flows have occurred through the fish ladder/fishway. The design validation report (that shall include verification of velocity, jump heights, water depths and energy dissipation) is to ensure the design criteria as outlined in the 90 percent design plans are met. Validation shall include an evaluation of the ladder for depth and velocities at the range of design flows and operational configurations.

3. The implementation report and photographs for fish ladder/fishway projects shall be submitted to NMFS and CDFG engineers/fish passage specialist. This review may be facilitated by NOAA RC and TEAM.

C. Annual Report

Annually, NOAA RC will prepare a report summarizing results of projects implemented under this Program during the most recent construction season and results of post-construction implementation and effectiveness monitoring for that year and previous years. The annual report shall include a summary of the specific type and location of each project, stratified by individual project, 4th field hydrologic unit code (HUC) and Evolutionary Significant Unit (ESU) and/or Distinct Population Segment (DPS). A copy of the report will be provided to NMFS, CDFG, and the Corps. The report shall include the following project-specific summaries:

1. A summary detailing fish relocation activity, including the number and species of fish relocated and the number and species injured or killed.

2. The number and type of instream structures implemented within the stream channel.

3. The length of streambank (feet) stabilized or planted with riparian species.

4. The number of culverts replaced or repaired, including the number of miles of restored access to unoccupied salmonid habitat.

5. The distance (feet) of aquatic habitat disturbed at each project site.

Post Implementation Monitoring Checklist (Version 3.0)

Applicant Name:
Landowner Name:
Project Name:
Project Location:
Stream:
Watershed (per Calwater 2.2.1): http://water.usgs.gov/GIS/regions.html
USACE File #:
Date (mm/dd/yy)

I. GENERAL QUESTIONS (Applicable to all projects)

Quantifying Impacts and Benefit to Fisheries

1. Total number of linear ft of stream dewatered during construction of this project: _____linear ft

2. Length of stream bank stabilized or planted with riparian species: _____linear ft

3. Total # of linear feet of stream disturbed during construction of this project: _____ linear ft

4. Fish species targeted by the restoration project (check appropriate)	Coho	Chinook	Salmon

5. Linear feet of upstream habitat made accessible by restoration project: _____linear ft

6. For projects where fish were relocated (answer per day/event)	Pass #1	Pass #2	Pass #3	Pass #4	TOTAL
6.a.method used to capture fish (seine, electrofishing, other)					
6.b. date and time					
6.c. water temperature at beginning of each pass					
6.d. # of fish captured (by species)					
coho salmon					
coastal chinook					
steelhead					
6.e. # of fish injured (by species)					
6.f. # of fish killed (by species)					

****If additional passes or events are necessary please provide additional data on each****

7. Names and contact information of qualified biologist and assistants (include DFG scientific collection permit #)

Qualified Biologist(s):	*Assistant(s):*

8. Describe where fish were relocated:		
9. What unanticipated circumstances arose during fish relocation activities (if any)?		
10. Was NMFS notified at least two weeks prior to relocation activities?	Yes	No
II. Project Terms and Conditions		
1. Were all applicable terms and conditions contained in the Biological Opinion met?	Yes	No
1.a. If no, describe which terms/conditions were not met and why?		
2. Was the project installed as approved and authorized ?	Yes	No
2.a. If no, attach a written and/or graphic description of any change(s) and an explanation of why the change(s) was necessary:		
3. Attach the following information to this checklist:		
3.a. Photo documentation of post-project conditions (photos should be take from the 4 cardinal directions and should be taken from established photo points for comparison to pre-project photo documentation) - max file size to be 250 KB		
3.b. Project as-built designs (if applicable):		
4. Was all construction related debris removed from the stream channel by October 15th?	Yes	No
5. Construction Duration:	Start Date:_____	End Date:_____
6. Was revegetation proposed as part of the approved project?	Yes	No
6.a. Was revegetation implemented as proposed?	Yes	No
6.b. If not, explain why?		
7. Photo documentation provided	Yes	No
8. Revegetation Completion Date:		
9. Were all areas of bare ground larger than 10ft X 10 ft treated for erosion control?	Yes	No

9.a. If not, explain why?

10. Provide photo documentation of erosion control

11. Were there any toxic chemical leaks/spills during implementation (including petroleum products)?	Yes	No

11.a. If yes, explain how the spill/leak was contained, if any chemicals were directly in contact with surface waters and who was informed at the time of the accident?

III. ADDITIONAL INFORMATION FOR FISH LADDER PROJECTS

1. Was a debris deflector incorporated at the flow intake?	Yes	No

1.a. If not, why?

2. Two annual monitoring reports with the following information shall be submitted to the NOAA RC no later than the April 30th for each of the <u>2 years</u> following construction and shall contain the following information:

2.a. Four photo reference points of the ladder/fish way shall be established following construction. Photos shall be taken under a variety of flow conditions including high winter flows (including at least one bank full event) and summer low flows once a year for a minimum of two years

2.b. A design report will be attached and shall include verification of velocity, jump heights, water depths, and energy dissipation. Purpose of this report is to ensure design plans were met. Validation report shall include an evaluation of the ladder for elevation, depth and velocities at the range of design flows and operational configurations.

IV. ADDITIONAL INFORMATION FOR CULVERT PROJECTS

1. Two annual monitoring reports with the following information shall be submitted to the NOAA RC no later than April 30th of each of the <u>2 years</u> following construction and shall contain the following information:

1.a. Photo reference points of the culvert shall be established following construction. Photos shall be taken under a variety of flow conditions including high winter flows (including at least one bank full event) and summer low flows once a year for a minimum of two years. Photo points of this report shall also include culvert inlet and outlet in order to demonstrate condition of culvert bottom.

1.b. A design report will be attached and shall include verification of velocity, slope, water depths, and energy dissipation (if used). Purpose is to ensure design plans were met. Validation report shall include an evaluation of the culvert for elevations, depth and velocities at the range of design flows and operational configurations.

V. ADDITIONAL INFORMATION FOR ROAD PROJECTS

Roads will be assessed by the project manager for two years to ensure all drainage facilities are performing as anticipated. The road shall be assessed prior to the start of the winter period (October 15th) and at least once during the rainy season (after 10" of rain or February 15th - which ever comes first). A report shall be submitted with photos of treatment sites by June 1st each year for two years following construction

Application Checklist (Version 5.0)

Application Date:

Expected Project Start Date:

Expected Project End Date:

Project Name:

Project Location:

Applicant Name:

Landowner Name:

Stream:

Watershed (per Calwater 2.2.1):

GPS Location (indicate latitude longitude decimal degrees):

PROJECT DESCRIPTION – ATTACH DOCUMENTS THAT ADDRESS THE FOLLOWING:

Describe current problem, solution and proposed benefits of your project. (attach additional information)				
Describe methods of implementation (i.e. hand crews, heavy equipment, chain saws).				
What minimization and avoidance measures will be implemented for this project.				
	Yes	**No**	**N/A**	**Notes**
Salmonid Species Present:				
Steelhead				
Northern California (NC) steelhead				
Central California Coast (CCC) steelhead				
South-Central California Coast (SCCC) steelhead				
Coho				
Southern Oregon / Northern California Coast (SONCC) coho				
Central California Coast (CCC) coho				
Chinook				
California Coastal (CC) chinook				
Project Types Requiring Additional Oversight:				
1. Please indicate if the project includes any of the following:				

	Yes	No	N/A	Notes
1.a. Culvert retrofit and installation				
1.b. Construction of new fish ladders				
1.c. Retrofitting of older fish ladders				
1.d. Removal of flashboard dams				
2. For stream crossing projects, does the proposed project pass all life stages of covered salmonid species that historically passed there? (Section II.A.4)				
2.a. Supporting documentation provided				
3. Proposed retrofit culverts meet the fish passage criteria for the passage needs of the listed species and life stages historically passing through the site prior to the existence of the road crossing (Section II.A.4)				
3.a. Supporting documentation provided				
4. Designs for fish ladders and culvert replacement or modifications are designed and stamped by a registered engineer. (Section II.A.4)				
4.a. Supporting documentation provided				
5. For fish ladder projects verify the following: (Section II.A.4 & Appendix 1.J)				
5.a. Fish ladder is less than 30 feet in height. (Section II.A.4)				
5.b. New ladder is designed to provide passage conditions suitable for year round bidirectional juvenile salmonid movement (Section II.A.4)				
5.c. New ladders have a maximum jump of six inches (Section II.A.4)				
5.d. Documentation of NMFS/CDFG written sign-off				
General Protection Measures:				
6. For fish screen installation, verify the following:				
6.a. Fish screen complies with NMFS/CDFG fish screen criteria				
6.b. Documentation of written sign off				
7. For placement of weirs and concrete lined channels				
7.a. Documentation of NMFS/CDFG written engineering sign off				
8. Verify that construction activities will occur between June 15 to October 15 (Appendix 1.A.5)				
9. Will construction occur within 200 feet of established riparian vegetation or other bird nesting habitats? (Appendix 1.A.5)				
9.a. If yes, verify that construction will start after August 1				
10. If poured concrete is used it shall be excluded from the wetted channel for a period of 30 days after it is poured or will be coated with appropriate sealant (Appendix 1.A.6)				
11. Rock used for bank stabilization or to anchor LWD structures, will be large and heavy enough to remain stationary under the 100 year median February flow event (Appendix 1.A.8)				
12. Verify that disturbance footprint of the projects staging areas will not exceed 0.25 acres (Section II.C.1.b)				
13. Will the project require dewatering of the work site?				
13.a. If yes, has (or will) the project proponent coordinated the project site dewatering with a qualified biologist to perform fish and amphibian relocation activities? The qualified biologist(s) must possess a valid State of California Scientific Collection Permit as issued by the CDFG and will be familiar with the life history and identification of listed salmonids and listed herptiles within the action area (Appendix 1.B.1.d)				

	Yes	No	N/A	Notes
13.b. The length of stream dewatered does not exceed 300 feet (Section II.C.1.a)				
14. The requirements outlined in the Program Description section entitled, *"General Conditions for all Fish Capture and Relocation Activities"* have been reviewed and applicable measures will be adhered to during implementation of the project (Appendix 1.B)				
14.a. Supporting documentation provided				
Measures to Minimize Disturbance from Instream Construction:				
15. The requirements outlined in the Program Description section entitled *"Measures to Minimize Disturbance from Instream Construction"* have been reviewed and applicable measures will be adhered to during implementation of the project (Appendix 1.D)				
15.a. Supporting documentation required				
Measures to Minimize Degradation of Water Quality:				
16. The requirements outlined in the Program Description section entitled *"Measures to Minimize Degradation of Water Quality"* have been reviewed and applicable measures will be adhered to during implementation of the project (Appendix 1.E.)				
16.a. Supporting documentation provided				
Measures to Minimize Loss or Disturbance of Riparian Vegetation:				
17. Native trees with defects, large snags > 16 inches (in) diameter breast height (dbh) and 20 ft high, cavities, leaning toward the stream channel, with active bird nests, late seral characteristics, or > 36 in dbh will be retained (Section II.C.1.b)				
17.a. All other applicable requirements outlined in *"Measures to Minimize Loss or Disturbance of Riparian Vegetation"* have been reviewed and applicable measures will be adhered to during project implementation (Appendix 1.H.)				
17.b. Supporting documentation provided				
18. Downed trees (logs) > 24 in dbh and 10 ft long will also be retained on upslope sites (Section II.C.1.b)				
Measures to Minimize Impacts to Non-Surfaced Roads in Project Area:				
19. The requirements outlined in the Program Description section entitled *"Measures to Minimize Impacts to Non-Surfaced Roads in Project Area"* have been reviewed and applicable measures will be adhered to during implementation of the project (Appendix 1.I)				
19.a. Supporting documentation provided				
Additional Project Information:				
20. Does the project propose the use of gabion baskets?				
21. Does the project propose use of cylindrical riprap (aqualogs)?				
22. Does the project propose use of chemically-treated timbers for grade or channel stabilization structures, bulkheads or other instream structures?				
23. Will the completed project substantially disrupt the movement of aquatic species indigenous to the waterbody, including those species that normally migrate through the action area?				
24. Will the project completely eliminate a riffle/pool complex?				
25. Does the project proponent propose to dewater more than 300 ft of stream?				
26. Does the project propose use of undersized rock within ordinary high water (rock incapable of withstanding a 100 year flow event)?				
Monitoring (Appendix 2.A):				

27. Pre-project photos attached (from minimum of four cardinal directions)				
28. The project applicant has reviewed all monitoring requirements necessary for coverage under this biological opinion and will submit reports as required	**Initials:**			

Please provide an explanation of any proposed deviations from the Program requirements as an attachment.

Signature:
By signing here, I certify all of the information indicated above is accurate. I have also reviewed the project description and terms and conditions of the biological opinion, and agree to comply:

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Applicant Date